

## 외이도 편평상피암종의 치료 경험

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### Squamous Cell Carcinoma of the External Auditory Canal : Treatment Results of 15 Cases

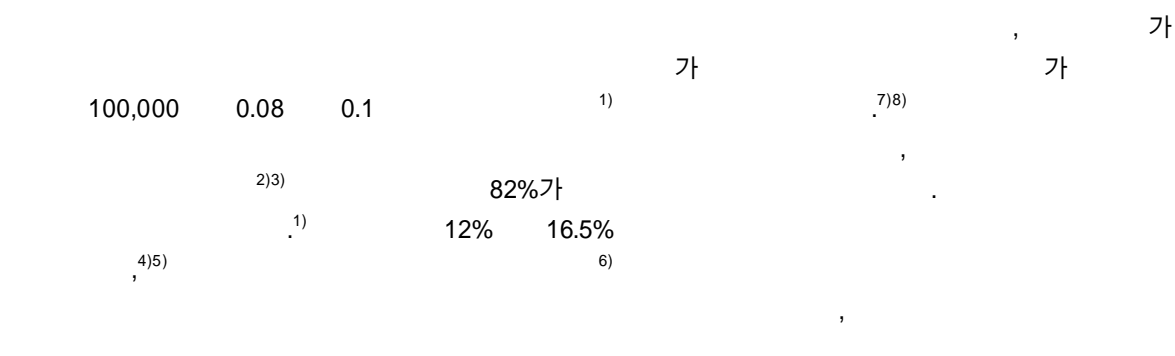
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#### ABSTRACT

**Background and Objectives** : The management of external auditory canal (EAC) squamous cell carcinoma (SCC) is very difficult because the structure of the temporal bone is complicated. We aimed to analyze the surgical results of EAC SCC and propose a treatment protocol. **Subjects and Method** : Fifteen patients with EAC SCC who underwent operations between July 1984 and June 2001 were analyzed. We divided the patients into five classes according to the extent of tumor progression. In patients classified under Class I, the tumor involved the cartilaginous ear canal. Tumors of patients within Class II involved the bony ear canal or mastoid cortex. Tumors that involved the deep structures of the temporal bone but limited involvement of within the middle ear cavity were classified under Class IIIA. In Class IIIB, tumors involved the facial canal, the base of the skull, or mastoid air cells. In Class IIIC, tumors involved the cochlea, the medial wall of middle ear, dura, sigmoid sinus, or other structures such as the parotid gland, carotid canal, or petrous apex. We analyzed data concerning patients and tumors, surgical methods, and surgical outcomes. **Results** : The number of patients classified under Class I, Class II, Class IIIA, Class IIIB and Class IIIC were 3, 3, 2, 1, and 6, respectively. Surgical approaches were local canal resection, partial temporal bone resection (TBR), subtotal TBR, and total TBR. Follow up period was 5 to 138 months with a mean ( $\pm$ SD) of 40 months ( $\pm$ 37.5), and the five-year disease free survival rate was 40.6%. **Conclusion** : From this study, we suggest the treatment modality for the EAC SCC. We recommend a partial TBR for surgery of Class I or Class II EAC SCC cancers, a subtotal TBR for Class IIIA, and a total TBR when it is close to Class IIIB or Class IIIC. (Korean J Otolaryngol 2005;48:136-41)

**KEY WORDS** : External auditory canal · Squamous cell carcinoma · Temporal bone resection.



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(Fig. 1A), Class 가 8 (Table 2).  
 가 10, 11, Class  
 (Fig. 1B) Class  
 , Class  
 A 가  
 (Fig. 1C), Class B 방사선 치료  
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 (Fig. 1D), Class C 6  
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 (Fig. 1E) , 2 7  
 CT MRI , 가 5 6  
 (Table 2). 12 cGy 180~200 cGy 5000~6000  
 가 16 MV 180 Gy , 1980 cGy  
 , 1 , 2 6 6 MV 4860 cGy  
 ( 10) ( 11) . 15 4MV 180 Gy  
 CT MRI 3240 cGy  
 수술 방법 4 MV  
 Class , 2 200 Gy 6000 cGy  
 . Class 1  
 , Class 3  
 , Class  
 Class C 1 Class C가 6 (40%) 가 ,

**Table 2.** External auditory canal carcinoma ; summary of cases

Patient	Sex/age	Tumor stage (Class)		Surgical treatment	Radiotherapy	Result (F/U months)
		Preoperative	Postoperative			
1	M/61	I	Same	LCR	No	NED (138)*
2	M/37	I	Same	PTBR	No	NED ( 32)
3	F/67	I	Same	PTBR	No	NED ( 38)
4	M/67	II	Same	PTBR	No	NED ( 31)
5	F/67	II	Same	PTBR	No	NED ( 28)
6	F/60	N/A	II	PTBR	No	LWD ( 24)*
7	F/64	IIIA	Same	STBR	Yes	NED (101)
8	M/52	IIIA	Same	STBR	Yes	NED ( 83)
9	M/62	IIIB	Same	STBR	Yes	LWD ( 25)
10	F/49	IIIB	IIIC	STBR	Yes	DWD ( 32)*
11	M/56	IIIB	IIIC	STBR	Yes	DWD ( 34)
12	M/48	IIIC	Same	STBR	Yes	DWD ( 29)*
13	M/35	IIIC	Same	TTBR	No	DWD ( 6)
14	M/56	IIIC	Same	STBR	No	DWD ( 5)
15	M/61	IIIC	Same	STBR	Yes	DWD ( 6)

LCR : local canal resection, TTBR : total temporal bone resection, STBR : subtotal temporal bone resection PTBR : partial temporal bone resection, N/A : not available, NED : no evidence of disease, LWD : live with disease, DWD : died with disease, F/U : follow up, \*Interviewed by telephone

Class A가 2 (13%), Class B가 1 (7%), Class  
Class 가 3 (20%) (Table 2).

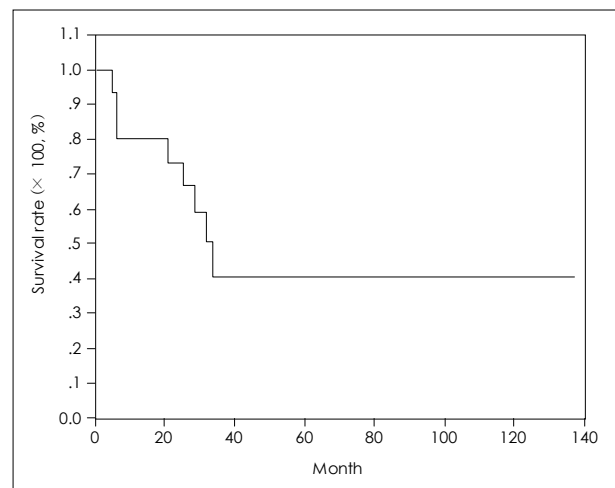
Class 3, Class  
3 2, 1 (6)  
. Class A 2, Class  
B 1 (11), Class  
C 6 3 (9), (10),  
(12) 3  
(Table 2).

가 3  
(Table 3).

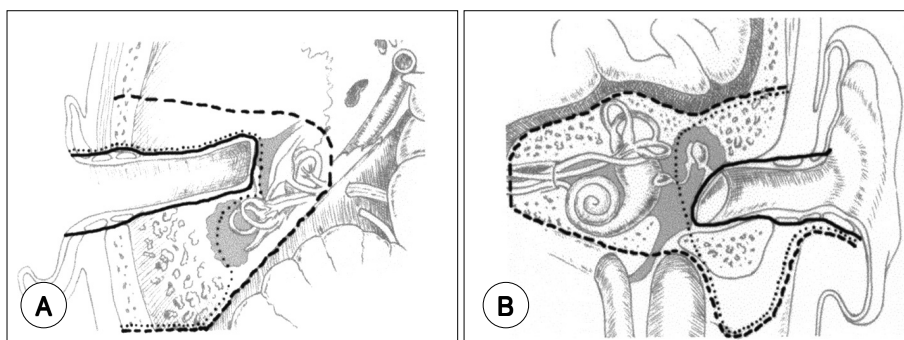
**Table 3.** Patterns of parotid node metastasis and direct parotid invasion according to tumor stage

Tumor stage	Patients (n)	Node metastasis (n)	Parotid invasion (n)
Class I	3	0	0
Class II	3	0	0
Class IIIA	2	1	0
Class IIIB	1	0	0
Class IIIC	6	2	3

15 2 가 2  
가 2  
(Table 2). Kaplan - Meier  
5 40.6% (Fig. 3).  
8 3  
5  
2,  
(Table 4).  
3 6  
3 (9, 11, 12) 가 가



**Fig. 3.** This graph shows survival rate of external auditory canal squamous cell carcinoma estimated by Kaplan-Meier method. Five-year disease free survival rate is 40.6%.

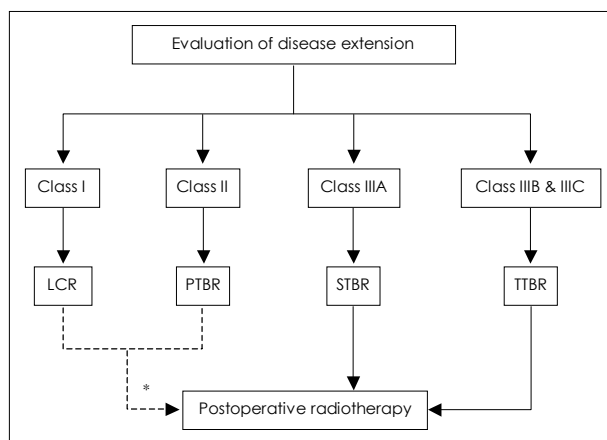


**Fig. 2.** Boundaries of surgical resection for external auditory canal (EAC) carcinoma.<sup>1)</sup> These axial (A) and coronal (B) views show neighboring structures from the EAC, anteriorly mandibular condyle, posteriorly cerebellum and sigmoid sinus, superiorly middle fossa, inferiorly carotid artery and jugular vein, medially middle & inner ear and carotid artery. Solid lines indicate the limits of a local canal resection that includes excision of all external auditory canal skin and removal of the lateral cartilaginous portion of the canal. Dotted lines indicate the limits of a partial temporal bone resection that includes excision of the entire external auditory canal, tympanic membrane, malleus and incus. Dashed lines indicate the limits of a subtotal temporal bone resection (STBR) that includes removal of the entire temporal bone. The limits of total temporal bone resection is STBR and further removal of petrous apex and/or carotid artery.

**Table 4.** Patterns of initial treatment failures

Patient	Sex/age	Tumor stage	Initial treatment	Time to recurrence (Mo)	Recurred or remained site
6	F/60	Class II	PTBR	16	Mastoid air cell
9	M/62	Class IIIB	STBR, postop RT	15	Posterior fossa dura
10	F/49	Class IIIC	STBR, postop RT	19	Mastoid air cell
11	M/56	Class IIIC	STBR, postop RT	11	Infratemporal fossa
12	M/48	Class IIIC	STBR, postop RT	12	Middle fossa dura
13	M/35	Class IIIC	TBTR	Remained tumor	Carotid artery
14	M/56	Class IIIC	STBR	Remained tumor	Middle fossa dura
15	M/61	Class IIIC	STBR, postop RT	Remained tumor	Posterior fossa dura

PTBR : partial temporal bone resection, STBR : subtotal temporal bone resection, TTBR : total temporal bone resection, Postop RT : postoperative radiation therapy



**Fig. 4.** Treatment protocol for external auditory canal squamous cell carcinoma, LCR : local canal resection, PTBR : partial temporal bone resection, STBR : subtotal temporal bone resection, TTBR : total temporal bone resection, \*If surgical margin is positive.

Moody 32, 85, 83, 40% Pittsburgh tumor staging system<sup>9)</sup> 2 50%, 7%, 14) Class Class Kinney<sup>13)</sup> Moody 14) Goodwin Pittsburgh

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son 4,000 1 ,<sup>10)</sup> Towson 20,000  
1 <sup>11)</sup> .  
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son .  
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 . Crabtree <sup>12)</sup>  
 , Goodwin <sup>3)</sup> Group 1, 2, 3 5  
57, 45, 29% . Kinney

(Fig. 2).<sup>1)14)17)</sup> 3 가

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<sup>16)</sup>

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Santorini fissures

<sup>17)</sup>

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Moody <sup>14)</sup>

Class

Class Class

, Class

A Class B

, Class C

Class

Class A Class B, Class C

, Class Class

(Fig. 4).

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